

Legacy Platinum SCR Chargers By Douglas Battery

Single-Phase SCR Battery Chargers USER'S MANUAL

Important Safety,
Installation,
Operation, and
Maintenance
Instructions



CHARGER RATINGS LABEL



The charger ratings label (see example below) provides the MODEL and SERIAL number identification for the factory-configuration of the charger that was ordered. This information will be required if service parts are needed.

The factory-wired AC input information is provided on the rating label: AC VOLTS, AC AMPS, PHASE and HERTZ. This information will be required for charger installation.

The DC output specifications, CELLS, DC VOLTS, DC AMPS, and AMP HRS, are the maximum nominal charger ratings. The charger is capable of being configured for lower DC AMPS/AMP HRS and was factory-configured for the output specified at the time of order, which means that the actual DC AMPS and AMP HRS output may be configured to be lower than the maximums listed on the ratings label. TYPE indicates the factory-configured battery type.

This charger is capable of multi-voltage output, multiple battery profiles, and capable of automatically charging batteries with CELLS and DC VOLTS up to the maximums listed on the ratings label. Each CELLS/DC VOLTS level requires configuration at the time of order to be active. Each CELLS/DC VOLTS level uses a unique battery profile that is specified at the time of order, so the DC AMPS, AMP HRS, and TYPE listed on the ratings label may not apply to all CELLS/DC VOLTS levels.

Please fill in the blank label that is provided below with the information from the ratings label on the front of your charger for future reference.

SERIAL		<input type="text"/>		LESTER ELECTRICAL		536R	
MODEL		<input type="text"/>		625 West A Street			
				Lincoln, NE 68522, USA			
Industrial Battery Charger							
AC VOLTS		AC AMPS		PHASE		HERTZ	
<input type="text"/>		<input type="text"/>		<input type="text"/>		<input type="text"/>	
DC VOLTS		DC AMPS		AMP HRS		TYPE	
<input type="text"/>		<input type="text"/>		<input type="text"/>		<input type="text"/>	
CELLS							
<input type="text"/>		<input type="text"/>		<input type="text"/>		<input type="text"/>	

Document any configuration or settings changes that are made by marking the ratings label on the front of your charger or on an additional label or tag on the front of your charger.

SAVE THIS MANUAL: Keep it in a location where it is available to anyone who may operate the charger.

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IMPORTANT SAFETY INSTRUCTIONS

1. **SAVE THESE INSTRUCTIONS** – This manual contains important safety and operating instructions.
2. Before using battery charger, read all instructions and cautionary markings on battery charger, battery, and product using battery.



LOOK FOR THIS SYMBOL TO POINT OUT SAFETY PRECAUTIONS. IT MEANS: *BE ALERT—YOUR SAFETY IS INVOLVED.* IF YOU DO NOT FOLLOW THESE SAFETY INSTRUCTIONS, INJURY OR PROPERTY DAMAGE CAN OCCUR.

3. **⚠ DANGER:** TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, CAREFULLY READ AND FOLLOW THESE IMPORTANT SAFETY AND OPERATING INSTRUCTIONS BEFORE INSTALLING OR OPERATING THE CHARGER.
4. **⚠ INSTRUCTIONS IMPORTANTES CONCERNANT LA SECURITÉ.**
5. **⚠ WARNING:** TO REDUCE THE RISK OF FIRE, INSTALL THIS BATTERY CHARGER ON A SURFACE OF NON-COMBUSTIBLE MATERIAL SUCH AS BRICK, CONCRETE, OR METAL.
6. **⚠ DANGER:** RISK OF ELECTRIC SHOCK. DISCONNECT CHARGER FROM BATTERY AND AC POWER BEFORE SERVICING. TURNING OFF THE CHARGER DOES NOT REDUCE THIS RISK.
7. **⚠ DANGER:** RISK OF ELECTRIC SHOCK. DO NOT TOUCH UNINSULATED PORTION OF AC OR DC CONNECTORS OR UNINSULATED BATTERY TERMINAL.
8. **⚠ DANGER:** RISQUE DE CHOCS ÉLECTRIQUES. NE PAS TOUCHER LES PARTIES NON ISOLÉES DU CONNECTEUR DE SORTI OU LES BORNES NON ISOLÉES DE L'ACCUMULATEUR.
9. **⚠ CAUTION:** CHARGE ONLY LEAD ACID BATTERIES. OTHER TYPES OF BATTERIES MAY BURST CAUSING PERSONAL INJURY AND DAMAGE. BEFORE CHARGING ANY OTHER TYPE OF RECHARGEABLE BATTERY, CHANGE THE CHARGER SETTINGS AS RECOMMENDED BY THAT BATTERY MANUFACTURER.
10. **⚠ ATTENTION:** UTILISER POUR CHARGER UNIQUEMENT LES ACCUMULATEURS AU PLOMB À ELECTROLYTE LIQUIDE. D'AUTRES TYPES D'ACCUMULATEURS POURRAIENT ÉCLATER ET CAUSER DES.
11. **⚠ CAUTION:** DO NOT EXPOSE TO RAIN. INDOOR USE ONLY.
12. **⚠ ATTENTION:** NE PAS EXPOSER À LA PLUIE.
13. **⚠ WARNING:** DO NOT DISCONNECT THE CHARGER PLUG FROM THE BATTERY CONNECTOR WHEN THE CHARGER IS ON. THE RESULTING ARCING AND BURNING WILL DAMAGE THE CONNECTORS AND COULD CAUSE THE BATTERIES TO EXPLODE. TURN CHARGER OFF FIRST!

-
14. **⚠ DANGER:** TO PREVENT ELECTRICAL SHOCK, DO NOT TOUCH EITHER AC OR DC UNINSULATED PARTS. MAKE SURE ALL ELECTRICAL CONNECTORS ARE IN GOOD WORKING CONDITION. DO NOT USE CONNECTORS THAT ARE CRACKED, CORRODED OR DO NOT MAKE ADEQUATE ELECTRICAL CONTACT. USE OF A DAMAGED OR DEFECTIVE CONNECTOR MAY RESULT IN A RISK OF OVERHEATING OR ELECTRIC SHOCK.
 15. **⚠ WARNING:** HAZARD OF ELECTRIC SHOCK.
 16. **⚠ WARNING:** Lead-acid batteries generate explosive gases. To prevent arcing or burning near batteries, do not disconnect DC charging cord from batteries when the charger is operating. Push and hold the “STOP/START” Button until charger turns OFF. Keep sparks, flame, and smoking materials away from batteries.
 17. **⚠ WARNING:** Always shield eyes when working near batteries. Do not put wrenches or other metal objects across battery terminal or battery top. Arcing or explosion of the battery can result.
 18. **⚠ WARNING:** Batteries produce hydrogen gas, which can explode if ignited. Never smoke, use an open flame, or create sparks near the battery. Ventilate the area when the battery is charging in an enclosed place.
 19. **⚠ WARNING:** Lead-acid batteries contain sulfuric acid, which may cause burns. Do not get acid in eyes, on skin, or clothing. If contact with the eyes occurs, flush immediately with clean water for 15 minutes and obtain medical attention.
 20. **⚠ WARNING:** Only your dealer’s Qualified Service Technicians should program or service this equipment.
 21. **⚠ CAUTION:** Do not operate the charger if it has received a sharp blow, been dropped, or otherwise damaged. Have your dealer’s Qualified Service Technician examine and repair as needed.
 22. **⚠ WARNING:** Do not disassemble the charger. Have the charger examined by your dealer’s Qualified Service Technician. Incorrect re-assembly of the charger may result in an explosion, electric shock, or fire.
 23. **⚠ CAUTION:** Make sure the battery system has the properly rated voltage, amp-hours, and type (Wet, Sealed, etc) for this charging system.

SAVE THESE INSTRUCTIONS

1. INTRODUCTION

This Legacy Platinum SCR battery charger is an advanced, silicon-controlled rectifier (SCR) charger. It was factory-configured to charge wet/flooded or sealed deep-cycle lead-acid batteries. The charger has an “I-E-I” profile, which is high-rate constant current (start/bulk region), constant voltage (plateau/absorption region), and low-rate constant current (finish region). It is controlled by an advanced microprocessor controller. Figure 1-1 lists the features of the controller, including automatic multi-voltage charging, individual amp-hour setting/battery profile per DC voltage level, field programmability, and a real-time clock. The charger can also be configured for opportunity charging.

Legacy Platinum SCR Controller Features
Advanced microprocessor control
User-specified, factory-configured battery profiles and AH settings
1-inch alphanumeric display characters
8 LED indicators and 4 buttons
Self diagnostic button
Voltage mismatch protection
Complete fault monitoring with shutdown protection
Automatic equalize/balance
Manual equalize/balance, stop, and start with buttons
Automatic multi-voltage charging
Individual battery profile and AH setting per voltage
2-line LCD display and navigation pad
“Plain English” menu system
Program/modify charger settings in the field
Review archived charge cycles
Real-time clock for time-of-day operations
Opportunity charging support

Figure 1-1: Legacy Platinum SCR Controller Features

Figure 1-2 provides specifications for the Legacy Platinum SCR product line.

Model Number	AC Phase	Nominal DC Volts, Max	Cell Count, Max	Amp-Hour Rating (C5), Max (8 Hrs.)	DC Amps, Max	AC Amps			Approx Shipping Weight (Lbs.)
						208V	240V	480V	
6-450B	1	12	6	450	72	10	9	4.5	180
6-550B	1	12	6	550	88	12	11	5.5	190
6-680B	1	12	6	680	109	14.5	13	6.5	193
12-380B	1	24	12	380	61	16	14	7	200
12-550B	1	24	12	550	88	22	19	9.5	223
12-680B	1	24	12	680	109	27	22	12	225
12-850B	1	24	12	850	136	33	29	14	260
18-600B	1	36	18	600	96	35	31	15	248
18-800B	1	36	18	800	128	45	38	19	290
24-600B	1	48	24	600	96	45.5	40	20	290

Figure 1-2: Legacy Platinum SCR Product Line Specifications

2. RECEIVING THE CHARGER

Unpack the charger and examine it for shipping damage. In the event that shipping damage is found, the preferred course of action is for the recipient to refuse delivery from the freight company. After refusing delivery of the charger, please contact your dealer to inform them of the refused delivery.

If the shipping damage is not discovered until after the item has been accepted from the freight company, please report it as a claim to the carrier.

3. STORAGE

When the charger is stored prior to being installed and powered up, it must be stored indoors in a clean and dry environment where the temperatures will remain within the range of 32°F to 120°F (0°C to 49°C). The charger should be stored upright, bolted to the shipping pallet, and covered by the plastic wrap and shipping carton that it was shipped in. This will help protect the charger from dust and abrasion. It should be stored in an area where it is not likely to be damaged. Do not stack anything on top of the charger.

4. LOCATION AND INSTALLATION

⚠ WARNING: DO NOT INSTALL THE CHARGER ON OR NEAR FLAMMABLE MATERIALS. POSITION THE CHARGER ON A FOUNDATION OF STONE, BRICK, CONCRETE OR GROUNDED METAL.

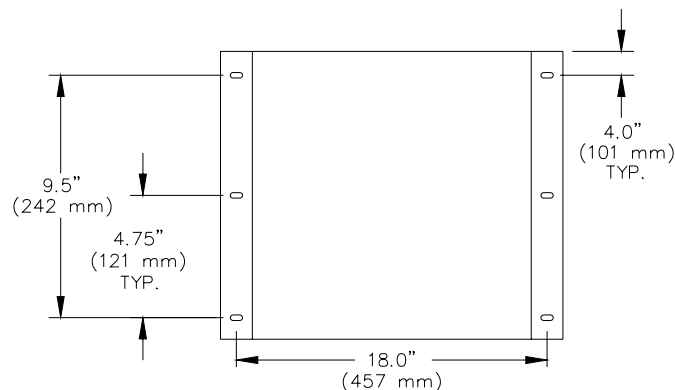
Proper installation of the charger is important in order to achieve good performance and to prevent damage to the charger and batteries. The charger should be located in a clean, cool, dry, and well ventilated area. To permit free air flow for convection cooling, allow 4 inches (102mm) minimum between the charger and any wall, 6 inches (152mm) from other equipment, and never store anything beneath the charger. Do not obstruct the airflow space around and beneath the charger.

Allow 36 inches (914mm) minimum clearance in front of the charger for ease of operation, maintenance, and service.

Install the charger in an area where the temperatures will remain within the range of 32°F to 105°F (0°C to 40°C) and the relative humidity will remain below 95 percent (%). Exceeding these ranges will reduce the current capacity and possibly the service life of the charger. If the charger will be operated outside of these ranges, contact the dealer to verify if it will withstand these conditions and perform at the needed capacity.

4.1 Horizontal Mounting

To bolt to the horizontal mounting surface, the mounting bolts will attach through the four mounting bolt slots in the bottom surface of the charger legs that are nearest the corners of the charger. The charger itself can be used as a template to mark the locations of the holes to be made in the mounting surface or the bottom mounting hole dimensions in Figure 4.1-1 can be used to measure the locations of the mounting bolt holes.



**Figure 4.1-1: Bottom Mounting Hole Dimensions
Single Phase**

4.2 Wall Mounting (Optional)

⚠ WARNING: THE CHARGER IS NOT TO BE POSITIONED ON, OR MOUNTED OVER, ANY FLAMMABLE SUBSTANCE.

⚠ WARNING: THE WALL AND THE FASTENERS USED MUST BE CAPABLE OF SUPPORTING THE DESIGN LOAD SHOWN IN FIGURE 4.2-1. USE APPROPRIATE FASTENERS FOR THE WALL CONSTRUCTION. THE USE OF FOUR MACHINE BOLTS IS REQUIRED TO SECURE THE LOAD. NOTIFY YOUR DEALER'S QUALIFIED SERVICE TECHNICIAN IF YOU HAVE ANY QUESTIONS OR PROBLEMS OCCUR.

⚠ CAUTION: ALLOW 4" (102mm) MINIMUM CLEARANCE BETWEEN THE CHARGER AND ANY WALL, 6" (152mm) FROM OTHER EQUIPMENT TO ALLOW FOR PROPER VENTILATION.

⚠ CAUTION: TO ENSURE THE STRUCTURAL INTEGRITY OF THE WALL MOUNTING BRACKETS: USE 8, 3/8" DIAMETER BOLTS (NOT PROVIDED) TO ATTACH BRACKETS TO A WALL/STRUCTURE. AVOID USING LAG BOLTS.

To install the wall mounting brackets, this procedure must be followed in sequence. The brackets are to be used as shown in Figure 4.2-2.

1. Locate the holes for the fasteners according to the dimensions in the illustrations. Note: Where applicable, connect fasteners directly to studs in the wall.
2. Use a level to ensure proper mounting.
3. Use each bracket as a template and mark where the mounting holes should be located. When locating the brackets, bracket flanges should face towards the inside. Do not use the slots for mounting the bracket to the wall.

⚠ CAUTION: THE CHARGER MUST BE SUPPORTED UNTIL IT IS SECURED TO THE BRACKETS.

4. Secure charger to brackets using the hardware provided with the wall mounting kit. (Refer to the appropriate illustration for placement instructions.)
5. When the charger / wall brackets are mounted on the wall, there will be a clear airflow space at the rear of the charger. This space should not be reduced or obstructed in any way.

⚠ WARNING: IF CHARGER IS DROPPED OR SEVERELY BUMPED DURING HANDLING, DO NOT OPERATE CHARGER. POSSIBLE DAMAGE OR UNSAFE OPERATING CONDITIONS MAY OCCUR. CONTACT YOUR DEALER'S QUALIFIED SERVICE TECHNICIAN.

Model Number	Enclosure Size	Charger Weight lbs. (Kg.)	Design Load lbs. (Kg.)
6-450B	Single Phase	180 (82)	900 (410)
6-550B	Single Phase	190 (86)	950 (430)
6-680B	Single Phase	193 (88)	965 (440)
12-380B	Single Phase	200 (91)	1000 (455)
12-550B	Single Phase	223 (101)	1115 (505)
12-680B	Single Phase	225 (102)	1125 (510)
12-850B	Single Phase	260 (118)	1300 (590)
18-600B	Single Phase	248 (113)	1240 (565)
18-800B	Single Phase	290 (132)	1450 (660)
24-600B	Single Phase	290 (132)	1450 (660)

⚠ WARNING: DO NOT STACK CHARGERS WHEN USING WALL MOUNTING BRACKETS. BRACKETS ARE DESIGNED TO SUPPORT ONE CHARGER ONLY.

Single-Phase Cabinet Dimensions: 19.0" W x 27.0" H x 17.5" D

Figure 4.2-1: Wall Anchor Design Load Table

Figure 4.2-1 shows the weight that the set of mounting bolts and their anchoring structure must withstand for the various charger types. The "Design Load" shows the "Charger Weight" times a safety factor of five (5). Be certain that both the mounting structure and the bolts will, at a minimum, support the "Design Load". Drywall or plaster will not be strong enough on its own, without proper structural reinforcement.

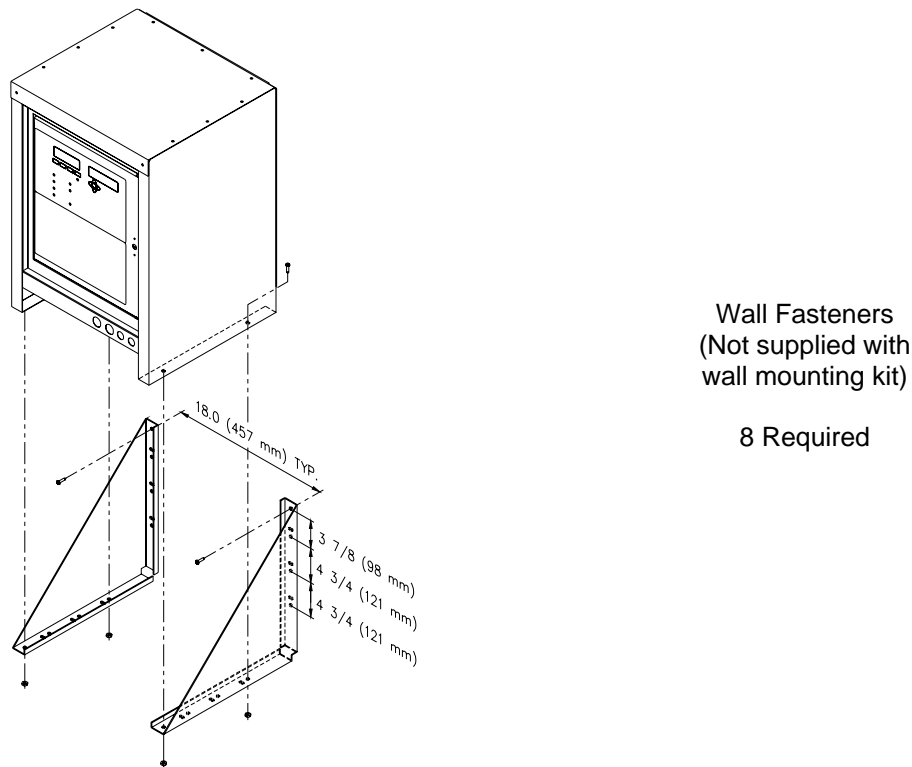


Figure 4.2-2: Single-Phase Charger Wall Mounting Bracket Installation

5. AC INPUT

AC INPUT POWER CONNECTIONS MUST BE INSTALLED BY A LICENSED ELECTRICIAN.

THE CHARGER DC OUTPUT SHOULD NOT BE CONNECTED TO A BATTERY DURING INSTALLATION OF THE AC INPUT POWER CONNECTIONS AND DURING INITIAL AC POWER UP.

The charger must be connected to the proper single-phase or three-phase AC power source as specified on the ratings label on the front of the charger. The AC frequency must be 60Hz, $\pm 3\%$ unless the charger ratings label reads "HERTZ 50/60", and then it may be operated at either 50Hz, $\pm 3\%$ or 60Hz, $\pm 3\%$. Check the ratings label on the front of the charger to determine the proper AC power source. The charger is pre-wired and fused at the factory for an AC input of 208, 240, or 480 V ($\pm 10\%$) as indicated on the charger ratings label.

The AC input voltage wiring of the charger can be changed in the field by your dealer's Qualified Service Technician. The minimum AC input wire size for each charger model and AC input voltage can be determined from Figure 5-1. Any changes must be documented on the charger ratings label on the front of the charger or on an additional label or tag, see second label on page 2 of this manual.

Model Number	DC Start Amps, Rated	AC Hertz	208V AC Input		240V AC Input		480V AC Input	
			Wire Size (AWG), Min	Amps, Rated	Wire Size (AWG), Min	Amps, Rated	Wire Size (AWG), Min	Amps, Rated
6-450B	72	60	12	10	12	9	12	4.5
6-550B	88	60	12	12	12	11	12	5.5
6-680B	109	60	10	14.5	12	13	12	6.5
12-380B	61	60	10	16	10	14	12	7
12-550B	88	50/60	8	22	10	19	12	9.5
12-680B	109	60	8	27	10	22	12	12
12-850B	136	50/60	6	33	6	29	10	14
18-600B	96	60	6	35	6	31	10	15
18-800B	128	60	6	45	6	38	10	19
24-600B	96	60	6	45.5	6	40	10	20

Figure 5-1: AC Input Specifications

5.1 AC Voltage Connections

THE CHARGER DC OUTPUT SHOULD NOT BE CONNECTED TO A BATTERY DURING INSTALLATION OF THE AC INPUT POWER CONNECTIONS AND DURING INITIAL AC POWER UP.

To connect the input AC voltage, route the AC supply wiring in conduit through the conduit hole in the floor of the charger case. Route the AC wiring to the terminal lugs of the fuse holder located below the AC fuses labeled F1 and F2 (single-phase) or above the AC fuses labeled F1, F2, and F3 (three-phase). For proper connections, torque the terminal lug screws to the “Terminal Lug Torque” shown in Figure 5.1-1 below.

Charger Type	Fuse Holder Size	Terminal Lug Size	Terminal Lug Torque
Single phase	30 amp or less	1/4-28 screws	25 inch-pounds
Single phase	35 amp or larger	3/8-24 screws	38 inch-pounds

Figure 5.1-1: AC Input Torque Specifications



WARNING: IMPROPERLY CONNECTED AC VOLTAGE CONDUCTORS CAN CAUSE AN ELECTRICAL FIRE.

Connect the AC ground to the terminal lug located below the AC fuses on the base floor (single-phase).



WARNING: DO NOT OPERATE THE CHARGER WITHOUT PROPER GROUNDING. IMPROPER GROUNDING CAN RESULT IN THE RISK OF AN ELECTRIC SHOCK.

5.2 AC Voltage Jumper Positions

The charger is factory wired for the AC input voltage (AC VOLTS) listed on the ratings label. Contact your charger dealer to have the AC voltage jumper positions changed for a different AC input voltage.

DOCUMENT ANY CHANGES ON THE RATINGS LABEL ON THE FRONT OF THE CHARGER OR ON AN ADDITIONAL LABEL OR TAG.

5.3 AC Fuses

The correct fuses for the factory wired AC input voltage were installed at the factory. If the AC input voltage is changed, it may be necessary to change the AC input fuses. Contact your charger dealer to have the AC voltage wiring changed and obtain the proper fuses.

USE ONLY THE CORRECT SIZE IDENTICAL TYPE REPLACEMENT FUSES. FUSES ARE AVAILABLE FROM YOUR DEALER'S QUALIFIED SERVICE TECHNICIAN.

5.4 Initial AC Power Up

The charger DC output should not be connected to a battery during initial AC power up. After applying AC power to the charger, it will execute a test routine. The routine takes approximately 15 seconds to complete. Do not connect the charger DC output to a battery until this routine is complete.

If the routine executes successfully, the Voltage and Battery Type String (for example “24VW”) will be shown on the main display, indicating that the charger is ready to be connected to a battery (see Section 9.2.2 for additional information regarding the Voltage and Battery Type String). If the routine detects an issue, one (1) of the codes listed in Figure 5.4-1 below will be shown on the main display. Figure 5.4-1 also provides instructions for correcting each potential issue.

Code	Issue	Solution
XFMR	The control transformer primary is mis-wired.	Contact your dealer's Qualified Service Technician to correct the control transformer primary wiring.
PWRA	The control board has AC power available, but the charger is unable to produce DC output power.	Contact your dealer's Qualified Service Technician. The issue likely lies in the charger AC path (AC contactor, AC fuses, etc.).

Figure 5.4-1: AC Power Up Faults

6. DOOR WITH SWITCHES AND AC CONTACTOR (OPTIONAL)

Chargers that were purchased with the AC contactor option are equipped with internal lockout switches on the front door. When the door is opened, the switches are opened, and AC control power is removed from the controller and the AC contactor, de-energizing both. This removes AC power from some internal components of the charger. **AC POWER IS STILL ENERGIZED AT THE AC INPUT CONNECTIONS, AC FUSES AND CONTROL TRANSFORMER INSIDE THE CHARGER.**

The controller will also open the AC contactor when a charge cycle is not active. This both conserves electricity and extends the lifetime of charger components, which reduces operating costs.

7. DC OUTPUT

The DC output cable includes a commonly-used connector. The polarity of the charger connector must be the same as the battery connector. The BLACK DC cable must be connected to the battery negative (-), and the RED DC cable must be connected to the battery positive (+). The charger will not operate if the polarity is reversed. The DC output fuse, F3 (single-phase), is a fast-acting fuse used to protect the SCRs.

USE ONLY THE CORRECT SIZE IDENTICAL TYPE REPLACEMENT FUSES. FUSES ARE AVAILABLE FROM YOUR DEALER'S QUALIFIED SERVICE TECHNICIAN.

This charger is capable of charging batteries with cell counts and DC voltages up to the maximums listed on the ratings label, as configured at time of charger order. Do NOT charge batteries with cell counts and DC voltages greater than those listed on the charger ratings label.

8. PROPER CARE OF DEEP-CYCLE MOTIVE POWER BATTERIES

Motive power batteries are subjected to severe deep-cycle duty on a daily basis. Although these batteries are designed to withstand such duty, the following precautions must be observed to obtain good performance and maximum cycle life.

⚠ CAUTION: ALWAYS WEAR PROTECTIVE EYE SHIELDS AND CLOTHING WHEN WORKING WITH BATTERIES. BATTERIES CONTAIN ACIDS WHICH CAN CAUSE BODILY HARM. DO NOT PUT WRENCHES OR OTHER METAL OBJECTS ACROSS THE BATTERY TERMINAL OR BATTERY TOP. ARCING OR EXPLOSION OF THE BATTERY CAN RESULT.

1. When installing new batteries, be sure the polarity of each battery and the overall battery pack is correct. Otherwise, battery and/or charger damage can result.
2. New batteries should be given a full charge before their first use because it is difficult to know how long the batteries have been stored.
3. New batteries and older batteries that have been in storage are not capable of their rated output until they have been discharged and charged a number of times.
4. **DO NOT EXCESSIVELY DISCHARGE THE BATTERIES.** Excessive discharge can cause polarity reversal of individual cells resulting in complete failure shortly thereafter.
5. Maintain the proper electrolyte level of wet (flooded) batteries by adding water when necessary. Distilled or deionized water is best for battery life. Never allow the electrolyte level to fall below the top of the battery plates. Electrolyte levels lower during discharge and rise during charge. Therefore, to prevent the overflow of electrolyte when charging, it is mandatory that water be added to cells **AFTER** they have been

-
- fully charged – do not overfill. Old batteries require more frequent additions of water than new batteries.
6. Hard crystalline sulfates form when batteries in storage are not maintained in a charged active state. Internal self discharge can bring about the start of this condition in as little as three days in warm temperatures. Batteries not maintained and allowed to sit in storage will self discharge, sulfate and lose capacity. Repeated charging without using the batteries between charges can recover some of the lost power, range, and life, but some permanent loss should be expected.
 7. Cold batteries require more time to fully charge. When the temperature falls below 65°F, the batteries should be placed on charge as soon after use as possible.
 8. The tops of batteries and battery hold downs must be kept clean and dry at all times to prevent excessive self discharge and the flow of current between the battery posts and frame. Electrolyte spilled on batteries never dries or evaporates.
 9. All connections to batteries must be maintained clean and tight. Due to heating and discharge rates, bolted connections loosen over time. Re-tighten the connections twice yearly to the torques specified by the battery manufacturers.
 10. Follow all operating instructions, cautions, and warnings as specified in this manual, on the charger, in the battery manuals, and in the vehicle manuals.

8.1 Personal Safety Precautions

1. Have someone within the range of your voice and close enough to quickly come to your aid when you work near a lead-acid battery.
2. Ensure that ample fresh water and soap are nearby in case battery acid contacts your skin, clothing, or eyes.
3. Wear complete eye and clothing protection. Avoid touching your eyes while working near a battery.
4. If battery acid contacts your skin or clothing, wash immediately with soap and water. If acid enters your eye, immediately flush your eye with running cold water for at least 10 minutes, and get medical attention immediately.
5. NEVER smoke or allow a spark or flame to be in the vicinity of a battery.
6. Be extra cautious to reduce the risk of dropping a metal tool onto a battery. It could spark or short circuit the battery or other electrical components that could cause an explosion.
7. Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a battery. A battery can produce a short-circuit current that is high enough to cause a severe burn.
8. NEVER charge a frozen battery.

9. CHARGER OPERATION

⚠ CAUTION: MAKE SURE THE BATTERY IS A RECHARGEABLE DEEP-CYCLE BATTERY WITH THE PROPER RATED VOLTAGE FOR THIS CHARGER.

⚠ DANGER: TO PREVENT ELECTRICAL SHOCK, DO NOT TOUCH UNINSULATED PARTS OF THE CHARGER DC OUTPUT CONNECTOR, BATTERY CONNECTOR, OR BATTERY TERMINALS. MAKE SURE ALL ELECTRICAL CONNECTORS ARE IN GOOD WORKING CONDITION. DO NOT USE CONNECTORS THAT ARE CRACKED, CORRODED OR DO NOT MAKE ADEQUATE ELECTRICAL CONTACT. USE OF A DAMAGED OR DEFECTIVE CONNECTOR MAY RESULT IN A RISK OF OVERHEATING OR ELECTRIC SHOCK.

⚠ WARNING: CHARGER IS NOT TO BE USED WHILE THE BATTERY POWERED EQUIPMENT IS OPERATING.

⚠ ATTENTION: *Ne pas utiliser le chargeur pendant que l'equipment est en marche.*

⚠ WARNING: LEAD-ACID BATTERIES GENERATE GASES WHICH CAN BE EXPLOSIVE. TO PREVENT ARCING OR BURNING NEAR BATTERIES, DO NOT DISCONNECT DC CHARGING CORD FROM BATTERIES WHEN THE CHARGER IS OPERATING. IF THE CHARGE CYCLE MUST BE INTERRUPTED, PRESS AND HOLD THE STOP/START BUTTON TO TERMINATE THE CHARGE CYCLE BEFORE DISCONNECTING THE DC OUTPUT CORD FROM THE BATTERIES. KEEP SPARKS, FLAME, AND SMOKING MATERIALS AWAY FROM BATTERIES.

⚠ WARNING: ALWAYS SHIELD EYES WHEN WORKING NEAR BATTERIES. DO NOT PUT WRENCHES OR OTHER METAL OBJECTS ACROSS BATTERY TERMINAL OR BATTERY TOP. ARCING OR EXPLOSION OF THE BATTERY CAN RESULT!

⚠ CAUTION: TO AVOID DAMAGE TO THE CHARGER CORD AND BATTERY CONNECTOR, DISCONNECT BY GRASPING THE PLUG HANDLE OR BODY AND PULLING IT STRAIGHT OUT OF THE BATTERY CONNECTOR. DO NOT PULL ON THE CHARGER CORD. DO NOT TWIST, ROCK OR PULL THE PLUG SIDEWAYS.

Legacy Platinum SCR chargers can be ordered and factory configured with highly-customized system settings and battery profiles. The system settings and battery profiles completely define the charging process from start to termination to equalization or balancing. The chargers can also be programmed in the field (see section 9.3.3). Thus, the typical operation explained below may not apply to a particular unit. Please contact your dealer with questions.

The charger was factory configured to charge wet/flooded or sealed deep-cycle lead-acid batteries. The charger has an "I-E-I" charge profile, which is high-rate constant current (start/bulk phase), constant voltage (plateau/absorption phase), and low-rate constant current (finish phase). If it is configured for opportunity charging, it will have a specialized "I-E" charge profile for daily cycles and a specialized "I-E-I" charge profile for equalization cycles.

1. With AC power properly applied to the charger, which will be indicated by the solid AC Applied LED, connect the charger DC output connector to the battery connector by firmly grasping both connectors and plugging them straight together. The charger will start automatically after a short delay, which is indicated by the solid Charging LED.
2. A equalize/balance charge cycle is indicated by a blinking Equalizing LED.
3. If the charger must be disconnected from a battery pack while a charge cycle is in progress, press the Stop/Start button on the user interface to stop the charge cycle before disconnecting the DC output connector from the battery. Do not disconnect the DC output connector from a battery pack while a charge cycle is in progress. The resulting arcing and burning of the connectors could cause the battery to explode.
4. The display(s) can be used to monitor the charge status (see sections 9.2.2 and 9.3).
5. If the charger is configured for multi-voltage charging, approximately 11 minutes after the start of a charge

-
- cycle, the main display will show “REST” for approximately 3 minutes while the DC output is shut off as part of the voltage detection routine.
6. The charge profile transition from the start/bulk phase to the plateau/absorption phase is indicated by the solid 80% Charged LED.
 7. For a balance charge cycle, the charge profile transition to the balance phase is indicated by both the blinking Charge Complete LED and the solid Equalizing LED.
 8. For an equalize charge cycle, the completion of the equalize phase is indicated by the solid Equalizing LED.
 9. The charger automatically terminates the charge cycle when the battery reaches full charge. The necessary charge time is affected by numerous factors. The major factors affecting the required charge time are the amp-hour capacity, depth of discharge, temperature, and age/usage of the battery. Completion of the charge cycle is indicated by the solid Charge Complete LED and both the Charging and 80% Charged LEDs turning off.
 10. Disconnect the charger DC output connector from the battery connector by grasping both connectors and pulling them straight apart.

9.1 Multi-Voltage Charging

Legacy Platinum SCR chargers are multi-voltage and capable of charging batteries with standard cell counts and DC voltages up to the maximums listed on the ratings label on the front of the charger. For example, a 24-cell/48-volt charger is capable of charging 24-cell/48-volt, 18-cell/36-volt, 12-cell/24-volt, and 6-cell/12-volt batteries. They automatically sense the DC voltage of the connected battery and adjust the DC output voltage accordingly. This feature eliminates the need to purchase multiple chargers for multi-voltage charging. An individual amp-hour setting and battery profile must be specified at the time of order for each supported battery cell count / DC voltage.

Please contact your dealer to inquire about multi-voltage charging using non-standard battery cell counts and DC voltages, other than 24-cell/48-volt, 18-cell/36-volt, 12-cell/24-volt, and 6-cell/12-volt.

When a charger is configured for multi-voltage charging, a voltage detection routine takes place at the beginning of a charge cycle. As part of this routine, approximately 11 minutes after the start of a charge cycle, the main display will show “REST” for approximately 3 minutes while the DC output is shut off as part of the routine. During this “REST” period the “Charging” LED will blink.

9.2 User Interface

The charger user interface includes a 4-digit alphanumeric display with extra-large 1” characters that are readable from a significant distance, 8 LEDs for indicators, and 4 buttons for operating the charger. Additionally, the user interface includes a large 2-line LCD display and navigation pad for accessing and modifying charger settings, viewing charge cycle parameters, and reviewing charge cycle history. The LCD displays “plain English” parameters, messages, and menus that are easy to understand and navigate.

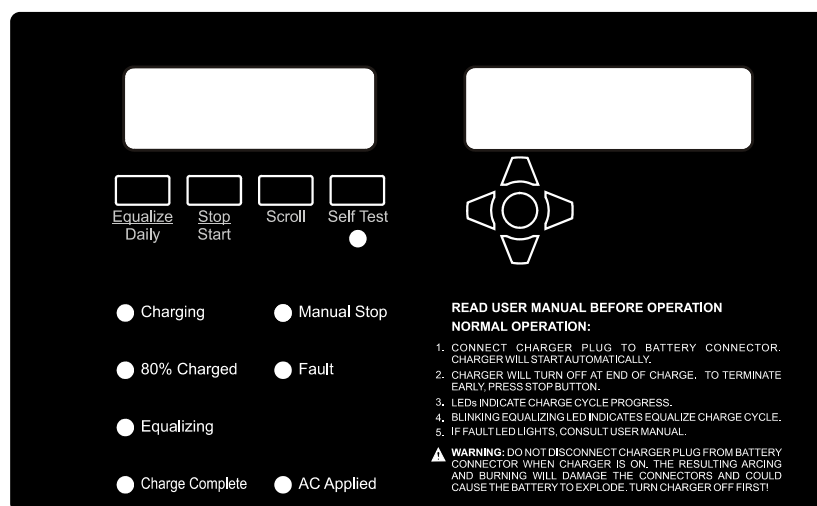


Figure 9.2-1: User Interface

9.2.1 Control Panel

To interact with the user, the user interface includes a control panel with 4 buttons, 8 LEDs (light emitting diodes), and a 4-digit alphanumeric display with high-visibility 1" characters. Figure 9.2.1-1 and Figure 9.2.1-2 describe the button and the LED functions, respectively.

Button	Description
Equalize/Daily	Converts a daily charge cycle to an equalize/balance charge cycle. Converts an equalize/balance charge cycle to a daily charge cycle.
Stop/Start	Stops a charge cycle that is in progress. Manually starts a new charge cycle.
Scroll	Scrolls through the real-time charge cycle parameters on the 4-digit alphanumeric display.
Self Test	Initiates a full factory self diagnostic test of the charger. See Section 9.5 for details.

Figure 9.2.1-1: Control Panel Buttons

When a charge cycle is in progress, the Self Test button is not functional; and the Equalize/Daily, Stop/Start and Scroll buttons must be held for a short amount of time before the charger will acknowledge the button press. This delay will guard against accidental button presses while a charge cycle is in progress.

LED	Description
Charging	Lights when a charge cycle begins. Turns off when the charge cycle completes. Blinks during the "REST" period of the multi-voltage charging voltage detection routine.
80% Charged	Lights when the 80% point (gassing voltage) is reached during a charge cycle. Turns off when the charge cycle completes.
Equalizing	Blinks when an equalize/balance charge cycle begins. Turns solid when the equalize mode completes or turns solid when the balance mode begins.
Charge Complete	Lights when a charge cycle completes successfully. Blinks when balance or post charge mode is occurring.
Manual Stop	Lights when the Stop/Start button is pressed while a charge cycle is in progress to manually stop charging.
Fault	Lights when a fault occurs. The display(s) will show the fault code. Fault codes are described in Section 9.4.

AC Applied	Lights when AC power is applied to the charger. Turns off when AC power is removed from the charger.
Self Test	Lights when a self diagnostic test begins. Turns off when the self diagnostic test completes. See Section 9.5 for details.

Figure 9.2.1-2: Control Panel LEDs

9.2.2 Main Display

The main display is a 4-digit alphanumeric display that communicates status information, charge cycle parameters, and fault codes to the user. With extra-large 1-inch characters, the display can be read from a significant distance. During a charge cycle, the user can press the Scroll button to select which real-time charge cycle parameter is shown on the display. Available parameters are current in amps (XXxA), voltage in volts (XX.XV), amp-hours returned (XXXX) and time on charge in hours and minutes (XX:XX). By default, the display toggles between the current in amps and voltage in volts. When a charge cycle is not in progress, the Voltage and Battery Type String is displayed.

Displays	Description
xxVb	Waiting for a battery to be connected to start a charge cycle. (See Voltage and Battery Type String information below.)
DONE	Charge cycle completed successfully.
TIME	Waiting for a programmed delay, time of day, or blackout start time before starting charge.
STOP	Manual stop was pressed to stop the charge cycle.
COOL	Charger is in the programmed cool down time after a completed charge cycle
REST	Charger DC output is shut off for approximately 3 minutes as part of the multi-voltage charging voltage detection routine. The output will start again automatically.
TEST	Self test is being performed.
PASS	The self test passed.
FAIL	The self test failed.
RDY	A battery is connected, but AC power is not yet available to the main transformer, so the charge cycle cannot be started. If this message is constantly displayed, an issue exists in the AC path (AC contactor, AC fuses, etc).

Figure 9.2.2-1: 4-Digit Display Information

Voltage and Battery Type String

The profile voltage and battery type information will be used to create a display string. The format will follow: xxVb.

Where:

xx = voltage (12, 24, 36, or 48) or M for multiple voltage.

V = indicates VOLTS.

b = battery type, where W = wet, S = sealed, O = opportunity charge, or M = more than one battery type exists among the multiple battery profiles.

Examples:

1. 24VW is 24-Volt wet.
2. MVW is multiple voltages wet.
3. MVM is multiple voltages and multiple battery types.

9.3. LCD Display and Navigation Pad User Interface

The charger user interface includes a 2-line, 32-character LCD display and navigation pad. These features enable the user to view the charger status and extended charge cycle parameters, view and change charger settings, and reviewing the charge cycle history by navigating the menu system diagrammed in Figure 9.3-1.

⚠ IMPORTANT: CHARGER WILL NOT START CHARGE CYCLE UNLESS LCD DISPLAY SHOWS THE MAIN MENU.

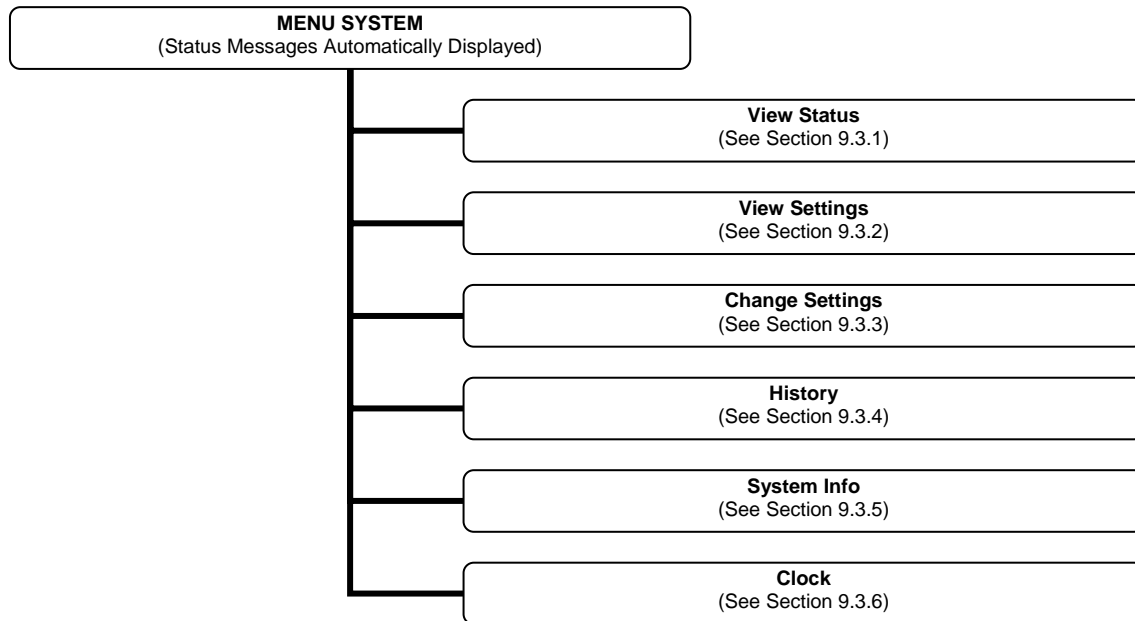


Figure 9.3-1: Menu System

Status messages are automatically displayed on the LCD. When a charge cycle is active, the first entry in the menu system, View Status, is automatically selected and the menu system is locked. When a charge cycle is not active, the Up and Down buttons on the navigation pad can be used to scroll through the menu items. An asterisk (*) denotes which menu item is currently active. Pressing the Select button or the Right button on the navigation pad opens the active menu item. The Left button on the navigation pad can be used to move back up the menu system. Figure 9.3-2 shows the navigation pad with the buttons labeled.

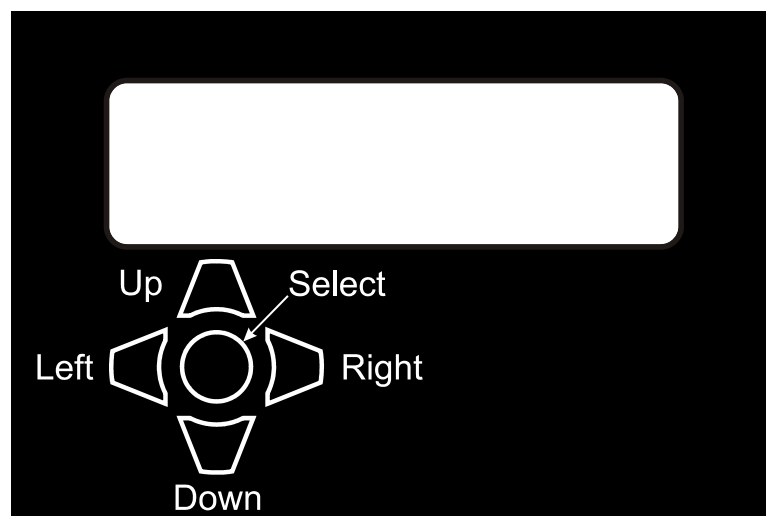


Figure 9.3-2: Navigation Pad

9.3.1 View Status

The first entry in the menu system, View Status, enables the user to view the charger status and charge cycle parameters. When a charge cycle is not active, the View Status menu provides the charger status. When a charge cycle is active, the View Status menu is automatically selected and the menu system is locked. Real-time charge cycle parameters are displayed in an easy-to-read format. The user can press the scroll button on the control panel to scroll through the following charge cycle parameters: voltage in volts, current in amps, amp-hours returned and time on charge in minutes.

9.3.2 View Settings

The second entry in the menu system, View Settings, enables the user to view the charger settings that define the charge profile(s). The View Settings menu is only accessible when a charge cycle is not active. Two menu items are available under View Settings – System and Battery Profile. System settings apply to all battery profiles. Battery Profile settings apply to a specific battery profile. When the user selects the Battery Profile menu, up to four battery profiles will be available, depending on the maximum battery cell count (voltage) of the charger and the configuration at the time of charger order.

The Up and Down buttons on the navigation pad can be used to scroll through the charger settings. Pressing the Select button or the Right button on the Navigation pad selects the current charger setting. The Left button can be used to navigate back up the menu system.

9.3.3 Change Settings



CAUTION: IMPROPER SETTING OF THE CHARGER PARAMETERS CAN CAUSE DAMAGE TO THE CHARGER OR BATTERIES.

The third entry in the menu system, Change Settings, enables the user to change select charger settings. The Change Settings menu is only accessible when a charge cycle is not active.

For security purposes, a password is required to enter the Change Settings menu. If you do not know your password, please contact your dealer. The Up and Down buttons on the navigation pad can be used to scroll through the characters. Pressing the Right button on the navigation pad selects the current character and advances the cursor to the next position in the password. The Left and Right buttons on the navigation pad can be used to move the cursor between positions. Pressing the Select button on the navigation pad enters the password. If an incorrect password is entered two times in a row, the menu system is automatically exited.

Two menu items are available under Change Settings – System and Battery Profile. System settings apply to all battery profiles. Battery Profile settings apply to a specific battery profile. When the user selects the Battery Profile menu, up to four battery profiles will be available, depending on the maximum battery cell count (voltage) of the charger and the configuration at the time of charger order.

The Up and Down buttons on the navigation pad can be used to scroll through the charger settings. Pressing the Select button or the Right button on the navigation pad selects the current charger setting. After selecting a charger setting, the Up and Down buttons on the navigation pad can be used to increment, decrement, or change the value. After selecting the desired value for a charger setting, pressing the Select button on the navigation pad enters the current value and modifies the setting. The Left button on the navigation pad can be used to move back up the menu system without modifying the setting.

The user-modifiable System settings are detailed in Section 9.6. The user-modifiable Battery Profile settings are detailed in Section 9.7.

9.3.4 History

The fourth entry in the menu system, History, enables the user to review both the history of the charger and specific parameters from the previous 96 archived charge cycles. The first entry in the History menu, Charge Info, provides a history of the charger. Figure 9.3.4-1 lists the available parameters and their descriptions.

Parameter	Description
Cycles	Total number of charge cycles
Cycles P1	Number of charge cycles using battery profile 1
Cycles P2	Number of charge cycles using battery profile 2
Cycles P3	Number of charge cycles using battery profile 3
Cycles P4	Number of charge cycles using battery profile 4
L Eq P1	Last equalize/balance cycle using battery profile 1
L Eq P2	Last equalize/balance cycle using battery profile 2
L Eq P3	Last equalize/balance cycle using battery profile 3
L Eq P4	Last equalize/balance cycle using battery profile 4
Hist Cnt	Total number of charge cycle history records

Figure 9.3.4-1: Charge Info Parameters

The Up and Down buttons on the navigation pad can be used to scroll through the Charge Info parameters. Pressing the Select button or the Right button on the navigation pad selects the current parameter. The Left button can be used to navigate back up the menu system.

The second entry in the History menu, Last Chrg, displays the parameters of the last charge cycle. The third entry in the History menu, Select History, enables the user to select from the 95 archived charge cycles previous to the record available through Last Chrg. Figure 9.3.4-2 lists the available parameters and their descriptions available through Last Chrg and Select History. The Select History menu will not display the Date/Time, T1, T2, or T3 values.

Parameter	Description
Date/Time	Start date and time (Last Chrg only)
T1	Time elapsed from start to knee 1 (Last Chrg only)
T2	Time elapsed from knee 1 to knee 2 (Last Chrg only)
T3	Time elapsed from knee 2 to termination (Last Chrg only)
Cycle #	Charge cycle number
Profile	Battery profile used
Chrg Time	Charge time
Term	Termination method used
AH Rtrnd	Amp-Hours returned
Init V	Initial battery voltage
Final V	Final battery voltage
E/B	Equalize/balance charge cycle (Y/N)

Figure 9.3.4-2: Archived Charge Cycle Parameters

The Up and Down buttons on the navigation pad can be used to scroll through the archived charge cycle parameters. Because of its length, the value of the Date/Time parameter is only displayed after pressing the Select button on the navigation pad. The Left button can be used to navigate back up the menu system.

9.3.5 System Info

The fifth entry in the menu system, System Info, enables the user to view select information regarding the charger. Figure 9.3.5-1 lists the available parameters and their descriptions.

Parameter	Description
Board SN	Control board serial number
Input Phases	Input phase
Phase Detect	Phase detect number
Input Volts	Charger factory input voltage wiring
Output Volts	Charger maximum output voltage configuration
System SN	Charger serial number
Num Profiles	Number of battery profiles
Model	Charger controller type
Ethernet	Ethernet option present (Y/N)
Mx AH Rt	Charger maximum battery pack amp-hour configuration
Mx C Rt	Charger maximum output current configuration

Figure 9.3.5-1: System Info Parameters

The Up and Down buttons on the navigation pad can then be used to scroll through the System Info parameters. Pressing the Select button or the Right button on the navigation pad selects the current parameter. The Left button can be used to navigate back up the menu system.

9.3.6 Clock

The sixth entry in the menu system, Clock, enables the user to both view and set the real-time clock. The first entry in the Clock menu, View Clock, displays the current day, date, and time of the real-time clock. The second entry in the Clock menu, Set Clock, enables the user to set the Day, Hour, Minute, Date, Month, and Year settings of the real-time clock.

The Up and Down buttons on the navigation pad can be used to scroll through the real-time clock settings. Pressing the Select button or the Right button on the navigation pad selects the current setting. After selecting a setting, the Up and Down buttons on the navigation pad can be used to increment, decrement, or change the value. After selecting the desired value for a setting, pressing the Select button on the navigation pad enters the current value and modifies the setting. The Left button on the navigation pad can be used to move back up the menu system without modifying the setting.

9.4 Fault Monitoring

The charger is constantly monitored for fault conditions. If a fault occurs, the charge in progress is terminated. The main 4-digit display alternates between showing the fault code and the characters "FLT". The LCD display also shows the fault code with a description. Figure 9.4-1 lists the fault codes and their descriptions.

Fault Code	Description
Mx V	Maximum voltage reached.
MxAH	Maximum amp-hours reached.
Mn V	Minimum voltage not reached.
TEMP	Temperature too high.
EPRM	Control board failure.
ERR	Maximum time reached for an individual charge cycle phase (bulk, etc) or the complete charge cycle.
ThRy	The output current began to significantly increase during a constant voltage charge cycle phase.

Figure 9.4-1: Fault Codes

A fault is cleared by disconnecting the battery from the charger or removing AC power from the charger. The user should determine the cause of the fault and correct it before starting a new charge cycle. It may be necessary to observe charger displays and function to determine the cause.

9.5 Self Diagnostic

The Self Test button should be used when it is suspected that the charger is not functioning properly. Pressing the Self Test button initiates a full self diagnostic, much like the final test performed in the factory at the end of the production line. The self diagnostic will not execute if a battery is connected to the charger. Internally, a test load is connected to the DC output of the charger, which ensures that a faulty battery does not affect the self diagnostic. The Self Test LED is illuminated while the self diagnostic executes. Figure 9.5-1 lists the self diagnostic error codes. In the event that the self diagnostic returns an error code, contact your charger dealer, and provide them with the error code.

Error Code	Description
E1	Control board failure
E2	Control board failure
E3	Control board failure
E4	Control board failure
E5	Control board failure
E6	PCB temperature sensor error
E7	N/A
E8	Battery connected (remove and re-test)
E9	SCR 1 error
E10	SCR 2 error
E11	SCR 3 error
E12	General SCR error
E13	AC path error (AC contactor, AC fuses, etc.)

Figure 9.5-1: Self Diagnostic Error Codes

9.6 System Settings

The charger was factory-configured with the System Settings that were specified at the time of order.

CBL LEN

CBL LEN should reflect the length of DC cable used on the charger. This value is used for calibration purposes.

Units	Feet
Range	1-50

CBL GAUGE

CBL GAUGE should reflect the gauge of DC cable used on the charger. This value is used for calibration purposes.

Units	American Wire Gauge (AWG)
Range	16-000

STORAGE ACT

STORAGE ACT defines if storage (refresh) mode is enabled and the type of storage mode. If storage mode is enabled, system settings T STORAGE and V STORAGE define when a storage (refresh) charge cycle starts, and system settings # TERM STORAGE, STOR MIN V, MAX T STORAGE, and MAX AH STORAGE define the termination conditions for storage mode.

Units	Disabled / Hours / Volts / Hours & Volts / Hours or Volts
Range	Off, Hours, Volts, Hrs & V, Hrs or V

T STORAGE

T STORAGE defines the delay between the end of a charge cycle and the automatic start of a storage (refresh) charge cycle if the battery is not disconnected from the charger if STORAGE ACT is enabled for Hours, Hrs & V, or Hrs or V.

Units	Hours
Range	24-168

V STORAGE

V STORAGE defines the battery voltage at which a storage (refresh) charge cycle will automatically start if a battery is not disconnected from the charger after the end of a charge cycle if STORAGE ACT is enabled for Volts, Hrs & V, or Hrs or V.

Units	Volts per Cell
Range	2.00-2.50

TERM STORAGE

TERM STORAGE defines the maximum number of storage (refresh) charge cycles before storage mode automatically terminates if STORAGE ACT is enabled for Hours, Volts, Hrs & V, or Hrs or V.

Units	Charge Cycles
Range	0-100

STOR MIN V

STOR MIN V defines the battery voltage below which a storage (refresh) charge cycle will automatically restart if one of the following is not met: set voltage is not reached, # TERM STORAGE value is not reached, or if a battery is not disconnected from the charger after the end of a charge cycle if STORAGE ACT is enabled.

Units	Volts per Cell
Range	2.00-3.00

MAX T STORAGE

MAX T STORAGE defines the maximum elapsed time of a storage (refresh) charge cycle before automatically terminating if STORAGE ACT is enabled for Hours, Volts, Hrs & V, or Hrs or V. If a charge cycle reaches this value it will terminate with a fault condition.

Units	Minutes
Range	30-1440

MAX AH STORAGE

MAX AH STORAGE defines the maximum amp-hours returned of a storage (refresh) charge cycle before automatically terminating if STORAGE ACT is enabled for Hours, Volts, Hrs & V, Hrs or V. If a charge cycle reaches this value it will terminate with a fault condition.

Units	Amp-Hours
Range	1-25,000

E/B ACT

E/B ACT defines if automatic equalize/balance mode is enabled and the type of equalize/balance mode. If automatic equalize/balance mode is enabled, system settings EB # CHRGS and EB DAY define which charge cycles will automatically be equalize/balance cycles.

Units	Disabled / Charge Cycles / Day of Week
Range	Off, Num, Day

EB # CHRGS

EB # CHRGS defines the number of charge cycles between automatic equalize/balance cycles if E/B ACT is NUM enabled.

Units	Charge Cycles
Range	1-100

EB DAY

EB DAY defines the day of week when all charge cycles will automatically be equalize/balance cycles if E/B ACT is DAY enabled.

Units	Day of Week
Range	Sunday-Saturday

SRT DLY ACT

SRT DLY ACT defines if a delay exists between the connection of valid battery to the charger and the automatic start of a charge cycle. If SRT DLY ACT is enabled, system setting STRT DELAY defines the duration of the delay.

Units	Enabled/Disabled
Range	Ena, Dis

STRT DELAY

STRT DELAY defines the duration of the delay between the connection of valid battery to the charger and the automatic start of a charge cycle if SRT DLY ACT is enabled.

Units	Minutes
Range	0-1500

BLCKOUT ACT

BLCKOUT ACT defines if a blackout time period exists when a charge cycle will not automatically start if a valid battery is connected to the charger. If BLCKOUT ACT is enabled, system settings B OUT STRT and B OUT END define the start and end of the blackout time period, respectively.

Units	Enabled/Disabled
Range	Ena, Dis

B OUT STRT

B OUT STRT defines the beginning of the blackout time period when a charge cycle will not automatically start if a valid battery is connected to the charger and BLCKOUT ACT is enabled.

Units	24-Hour Time
Range	00:00-23:59

B OUT END

B OUT END defines the end of the blackout time period when a charge cycle will not automatically start if a valid battery is connected to the charger and BLCKOUT ACT is enabled.

Units	24-Hour Time
Range	00:00-23:59

COOL DN ACT

COOL DN ACT defines if a cool down period will occur at the end of a charge cycle. If COOL DN ACT is enabled, system setting COOL T defines the duration of the cool down period.

Units	Enabled/Disabled
Range	Ena, Dis

COOL T

COOL T defines the duration of the cool down period if COOL DN ACT is enabled.

Units	Minutes
Range	0-1200

STRT T ACT

STRT T ACT defines if a charge cycle will only start, if a valid battery is connected to the charger, after a specified time. If STRT T ACT is enabled, system setting STRT T defines the time at which a charge cycle will automatically start if a valid battery is connected.

Units	Enabled/Disabled
Range	Ena, Dis

STRT T

STRT T defines the time at which a charge cycle will automatically start when a valid battery is connected if STRT T ACT is enabled.

Units	24-Hour Time
Range	00:00-23:59

SULF MIN

SULF MIN defines the minimum duration of time that the charger will remain in start current regardless of battery voltage to break down sulfated batteries for WET type batteries only.

Units	Minutes
Range	0-10

9.7 Battery Profile Settings

The charger was factory-configured with the Battery Profile Settings that were specified at the time of order.

STRT C

STRT C defines the start current.

Unit	Amps
Range	0.1-Charger Maximum

FIN C

FIN C defines the finish current.

Unit	Amps
Range	0.1- 50% of STRT C

T PST KNEE

T PST KNEE defines the duration of time after the first knee (or 80% point) before the charge cycle is automatically terminated if Time Past Knee termination is enabled in the battery profile.

Unit	Minutes
Range	30-600

MX CHRG T

MX CHRG T defines the maximum charge cycle duration before automatic termination.

Unit	Minutes
Range	30-1440

% RTRN

% RTRN defines the percent of amp-hour return to occur before the charge cycle is automatically terminated if Percent Amp-Hour Return termination is enabled in the battery profile. This is a percentage above 100. Example: 10 = 110%.

Unit	Percent
Range	0-50

PCC T

PCC T defines the maximum duration of time before Post Charge is automatically terminated if Post Charge is enabled in the battery profile.

Unit	Minutes
Range	0-1440

AH RATING

AH RATING defines the amp-hour rating of the battery pack. This is used to calculate proper start and finish current ratings for the charger.

Unit	Amp-hours
Range	100-Charger Maximum

10. MAINTENANCE

⚠ WARNING: DISCONNECT BOTH AC AND DC POWER FROM THE CHARGER BEFORE ENTERING THE ENCLOSURE. CONTACT WITH LIVE COMPONENTS WITHIN THE CHARGER COULD CAUSE ELECTRICAL SHOCK, SERIOUS INJURY, OR DEATH.

⚠ CAUTION: KEEP CHARGER CLEAN AND DRY, INSIDE AND OUT. FAILURE TO DO SO MAY CAUSE DAMAGE OR FAILURE OF CHARGER.

The charger requires minimal maintenance. It should be kept clean and all connections tight. BE CERTAIN THAT THE CHASSIS IS SECURELY GROUNDED. Twice a year, or as often as the cleanliness of the area may dictate, the louvers should be vacuumed and the interior thoroughly blown clean with dry compressed air. The components of the charger are cooled by natural convection. If dust and debris are allowed to build up, they will restrict airflow and could cause components to overheat.

Moisture may cause electrical shorting and/or corrosion. It may also combine with dust and debris making them more difficult to remove. Do not use liquids to clean the charger. Liquids could cause damage. Compressed air should be used to clean dust and debris from the charger and its components.

It may be necessary to remove the top panel and/or back panel from the charger cabinet to allow access to internal components for cleaning. Always be careful not to bump wiring or components. This could cause loose connections and failures.

10.1 Check Charger Area

The area around the charger must remain clean, cool, dry, and well ventilated. Check for obstructions to airflow, clearances, or other violations of the requirements in Section 4.

10.2 Visual Inspections

Check the charger for any physical failures, such as loose contacts or hardware, excess wear, or damage. Darkened or hot terminals should be tightened or replaced.

10.3 Battery Conditions

Batteries must be well maintained for the charging system to operate properly. Follow battery manufacturer instructions for battery maintenance. Check for loose connections or corrosion.

⚠ CAUTION: CHECK THE DC CONNECTIONS FROM THE CHARGER TO THE BATTERY AND MAKE SURE THEY ARE TIGHT AND CLEAN. TIGHTEN AND/OR CLEAN IF NEEDED. FAILURE TO DO SO COULD CAUSE MALFUNCTION, FIRE, OR EXPLOSION.

DC connections may become corroded over time. If the connections become corroded, they should be cleaned as recommended by the battery manufacturer. After the connections have been cleaned, a battery connection treatment should be applied to help prevent corrosion from reoccurring. Contact the battery manufacturer for their recommendations.

Periodic cleaning and watering of non-sealed batteries is very important. Logging the water usage of non-sealed batteries is useful. As a battery ages, it will use more water.

11. TROUBLESHOOTING AND SERVICE

⚠ WARNING: USE EXTREME CAUTION WHEN WORKING INSIDE THE CHARGER OR WITH THE CHARGING SYSTEM. DO NOT ATTEMPT TO WORK INSIDE THE CHARGER UNLESS YOU ARE A QUALIFIED SERVICE TECHNICIAN OR ELECTRICIAN. HIGH VOLTAGES APPEAR AT SEVERAL POINTS INSIDE THE BATTERY CHARGER. DISCONNECT AND LOCK OUT BOTH AC AND DC POWER FROM THE CHARGER BEFORE REMOVING ANY COMPONENT. CONTACT WITH LIVE COMPONENTS WITHIN THE CHARGER COULD CAUSE ELECTRICAL SHOCK, SERIOUS INJURY, OR DEATH.

The charger was fully tested and calibrated before leaving the factory. It was delivered ready to charge with user-specified, factory-configured amp-hour settings and battery profiles. If properly installed, the charger should require very little attention. If improper charger operation occurs, it will require repair by your dealer's Qualified Service Technician. CONTACT YOUR CHARGER DEALER FOR TROUBLESHOOTING AND SERVICE.

NOTES

Represented By:

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